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ABSTRACT

This program was developed and implemented to enhance multimedia training to optimize multimedia usage in the classroom and reduce negative behaviors in a target group of middle school and high school science students in the exceptional student education (ESE) classroom. Exceptional student education provides alternative education for disruptive middle and high school students. A target group of 13 ESE students and two ESE teachers was established for the program. The objectives for the program were for: 100% of the students to increase knowledge, comfort level, and build enthusiasm for technology; 80% of the target students to increase their behavior grades by one point on a five point scale; 100% of the target students to complete a full multimedia project by the end of the project with a grade of 85%; and for 100% of the participants to rate the training modules a three or above on a scale of one to five. All program objectives were met with the target group improving dramatically in all areas. Appendices include a pre- and post-teacher/student multimedia survey, participant information, project evaluation, post interview, permission to participate letter, technology usage chart, grant from MSTAT, inservice agenda, project checklist, student to student critique, and software evaluation. (Contains 18 references.) (Author/SWC)

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Improving Multimedia Technology Usage in an Alternative Secondary School by Infusing Training into the Classroom

by

Karen A. Michalak

Practicum Internship submitted to the Faculty of Nova Southeastern University partial fulfillment of the requirements for the degree of Master of Science

July 28, 1997

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Abstract

Improving Multimedia Technology Usage in an Alternative Secondary School by Infusing Training into the Classroom
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Descriptors: Technology/ Multimedia/ Emotionally Handicapped/ Severely emotionally Handicapped/ Middle School and High School Dropouts/ Dropout Prevention/ At-Risk Students/ Social Failures/ Cooperative Learning/ Science Education/ Behavior Modification

This program was developed and implemented to enhance multimedia training by the author to optimize multimedia usage in the classroom and reduce negative behaviors in a target group of middle school and high school science students in the exceptional student education (ESE) classroom. A target group of 13 ESE students and two ESE teachers was established for the program. The objectives for the program were for 100 percent of the students to increase knowledge, comfort level and build enthusiasm for technology: 80 percent of the target students increase their behavior grades by one point on a five point behavior scale, 100 percent of the target students to complete a full multimedia project by the end of the project with a grade of 85 percent and for 100 percent of the participants to rate the training modules a three or above on a scale of one to five. All program objectives were met with the target group improving dramatically in all areas. Appendixes include a pre and post teacher/student multimedia survey, participant information, project evaluation, post interview, permission to participate letter, technology usage chart, grant from MSTAT, inservice agenda, project checklist, student to student critique and software evaluation.

Authorship Statement

I hereby testify that this paper and the work it reports are entirely my own. When it has been necessary to draw from the work of others, published or unpublished, I have acknowledged such work in accordance with accepted scholarly and editorial practice. I give this testimony freely, out of respect for the scholarship of others in the field and in the hope that my own work, presented here, will earn similar respect.

Karen A. Michalak
student's signature

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Practicum title Improving Multimedia Technology usage in an Alternative Secondary School by Infusing Training into the Classroom

Student's name Karen A. Michalak Completion date June 11, 1997

Project site Schwettman Education Center

Mentor's name Alan Knight (print) Alan Knight (signature)

Mentor's position at the site Administrator Phone # 813-836-3420

Comment on impact of the project (handwritten):

Karen's research project was a seccess beyond our Schools expectations. As a high technology School we needed to motivate Staff and Students to use available technology beyond basic operation the multimedia project not only promoted creativity in the targeted academic classes, but enthusiastically spread throughout the School.

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CHAPTER 1

Purpose

The school involved in this research project was located in a rapidly growing county that included both rural and urban communities in the southern part of the United States. Originally founded in 1928, the structure has housed high school, elementary school, sat vacant for a period of time and housed an adult education population. In 1993, the school was renovated into a high technology alternative school for disruptive middle and high school students. The cap on enrollment was 150 middle and high school students, including Exceptional Student Education (ESE), with an average daily enrollment of 132 students. Students participated at the school through voluntary enrollment. Seventy-five percent of the students were bussed from home school areas, 20 percent of the students used other transportation and five percent walked to school. Students' home schools were from all middle and high schools on the west side of the county. Since the alternative school's inception in 1993, there has been a long list of students, parents and sending schools waiting for space for placement.

The socioeconomic status ranged from lower income families to upper middle class families. The enrollment showed about 50 percent with only one parent or other guardian in the household; a few students lived without parent or guardian supervision. Eighty-five percent of the

students enrolled received breakfast and lunch through the no-cost or reduced price lunch program provided by the federal government. Due to students' voluntary participation, court proceedings, and students returning to home schools, student turnover was extremely high. Students were required to stay a minimum of 90 days or one semester and the maximum was one to two years with the goal focused on students returning to their home school. School district information services reported the county's racial and ethnic composition to be 100 Native American, 1,756 African descent (black), 2,665 Hispanic, 488 Asian or Pacific Islands, 38,628 Caucasian (non-Hispanic). The target site had a composition of one Native American, four African descent (black), five Hispanic, no Asian or Pacific Islanders, 167 Caucasian (non-Hispanic). Both teacher participants were Caucasian.

District School Board guidelines limited class size from eight to fifteen students. Middle School students were grouped into two groups. The first were the honors group, students who had spent one year at the target site and were being prepared to transition back to their home schools. These students attended the target site for the minimum required time, and in some cases, for extended time periods. The teams of teachers, administrators and support staff have determined that the student worked through personal difficulties and was ready to be prepared to return to the home school. The academic focus for these students was much stronger and behavioral expectations had been raised. The team worked with both the student and the family so that all

involved had a clear understanding of expectations to provide for a smooth transition back to a mainstream school. A second group of middle school students were like the high school students and were grouped heterogeneously. The Exceptional Student Education students were placed according to their Individual Education Plan (IEP). Even though the school was departmentalized, an effort was being made to integrate interdisciplinary activities in all areas of the target site.

The target site was a voluntary dropout prevention program which the district provided for students who had violated school board policy, seriously disrupted the learning environment of the school, been expelled from school, or demonstrated a behavior pattern which had not improved by a continuum of positive intervention strategies. Faculty at the site were encouraged to use new and innovative teaching styles focusing on hands on approaches and nontraditional methods of teaching. Evaluation of student achievement was done through traditional assessment, computer generated reports of specific skills, and the use of portfolio assessment. Many students came to view the school community as a family. The staff focused on helping the students meet their own agenda and find success.

The target site billed itself as a nontextbook school, relying heavily on technology, textbooks as reference materials and trade books for media sources. The author worked as the Media/Technology Specialist at the target site and coordinator of the integrated learning lab which was set up in the classrooms using Computer Curriculum Corporation's

program (CCC Lab).

As the target site media specialist, the researcher was responsible for the operation and maintenance of the school library media program. Included in the job description was the design, consultation, information and administration of all media center activities. Job title number two was the target site's Technology Specialist. The researcher, in collaboration with the target site media/technology committee, was responsible for coordinating, organizing and facilitating the effective utilization of instructional technology within the school setting. Included in the job description was the design, consultation, information and administration of all target site technology and networks. Job responsibility number three was the Integrated Learning Lab Coordinator. The researcher was primarily responsible for the scheduling, monitoring, operation and maintenance of the integrated learning system at the school site. Duties included, but were not limited to:

1. Providing technical assistance to school staff for use of the software and hardware resources of the integrated learning system.
2. Providing assistance to teachers in monitoring of students using the system.
3. Coordinating schedules of students in conjunction with teachers whose classes are using the system.
4. Maintaining and providing student/class reports to teachers.
5. Assisting teachers in the interpretation and use of student/class reports provided by the integrated learning system.
6. Maintaining and inventorying hardware, software, and supplies for the system.

7. Coordinating system repair service and updates by the vendor.
8. Participating in study and training as necessary to update knowledge of the integrated learning system.
9. Performing other duties as assigned by the school principal or designee.

The researcher was also involved in curriculum development and training of teachers, parents and community members at the school level, district level and state level. Some training topics included: technology, motivation, alternative education, behavioral modification, Reading Mastery, Key Math, beginning teacher professional development programs and grant writing.

The target facility was a new concept in the county for alternative education of disruptive middle and high school students. The major focus at the target site was social skills training and utilization of a high level of technology to teach academics rather than traditional styles of teaching. Of the 14 academic instructors hired for this high technology school, only three were comfortable using technology in teaching when hired on. There was a 54 percent discrepancy of teachers not using technology. Ideally, all 100 percent of the academic instructional teachers should have been comfortable using technology in their everyday teaching in this high technology, non-textbook setting. The author observed that even after offering 120 hours of inservice training the previous year, much of the technology at the target site was not being utilized in the classroom setting and potential instructional use of technology was not being fully explored. Teachers at the target site had

participated in technology training to assist with the basics of technology: however, technology at the target site was being underutilized due to lack of familiarity. There was an urgent need to provide the teachers with training and offer instructional opportunities to experience the wide variety of applications available in technology equipment utilization, further encouraging its use with students in more classrooms.

As the Media/Technology Specialist, the author was in the classrooms approximately 70 percent of the day while students were on campus. In this position, the author noted that, even though the instructional staff had basic computer knowledge for teacher oriented tasks, the high level technology at the site was not being used effectively to impact student learning. Media resources and materials for curriculum design were readily available but were not being used. The researcher was aware that change takes time and persistence and that educators at the target site needed to adapt to the needs of the students.

The individuals that had been trained in the current technology fields were aware of the experiences that technology could offer in the field of student learning. However, they were making few, if any, changes in the established pattern of technology usage. Some concerns were beginning to rise at a higher level than ever before. Educators wanted to know how technology usage could affect student learning, how could they relate technology to what they were doing in the classroom. Even though many of the students had been trained in multimedia technology, only a small group were using multimedia as a performance

demonstration to document mastery of content. Because of teachers' lack of comfort level, the opportunities to use multimedia were not presented in the classroom for students to use.

This research project focused on 13 Exceptional Student Education (ESE) science students and two educators. The ESE students were grouped in classes combining high school and middle school students grades six through twelve with two educators. The results of the initial multimedia survey (Appendix A, p. 44) identified the need for more multimedia training at this level. Teachers and students had an understanding of what multimedia was through purchased software kits that had been used extensively in the classroom. However, they did not, according to the survey, have an understanding of multimedia development and incorporating self-made multimedia projects into the curriculum. The researcher believed that, even though the educators have had initial training in multimedia techniques so they could bring multimedia into the classroom without strong consistent on-site follow-up assistance, the project overwhelmed them and the educators went back to using packaged materials. Both teachers and students needed to see that multimedia could be considered a way of mastering the curriculum, multimedia alone was not the curriculum.

The author proposed a model for effective teacher training to improve technology usage in an alternative school setting with target high school, middle school and Exceptional Student Education (ESE) academic teachers and students. The purpose was to increase teacher

and student awareness, adaptation, analysis, and application to a comfort level that assisted in building enthusiasm for multimedia technology. A second goal was to have the target group of teachers use these new strategies in the classroom with the students to enhance their delivery of content material. ESE science students studied resources and materials needed for multimedia production, design and presentation at the end of the 12 week project.

The proposed objectives were: If, after the 12-week multimedia technology training period, 100 percent of the students increased knowledge, comfort level and built enthusiasm for technology, as exhibited by their increased use of technology in the classroom shown through the researcher's random observations and comparison of a pre and post survey, this objective would be met. (Appendix A, p.44)

If after 12 weeks, 80 percent of the target students increased their behavior grades by one point on a scale of one to five, then this objective would be met. This was evaluated by comparing the pre and post implementation scores. (Appendix B, p.47)

If, at the end of the 12-week multimedia technology training period, 100 percent of the target students completed a full multimedia project and scored 85 percent on the final evaluation instrument, this objective would have been met. This was determined by an evaluation rubric. (Appendix C, p. 50)

If, after the 12 week multimedia technology training period, 100 percent of the target participants responded a three or higher on a scale

of one to five to the various modules used in presenting training, this objective would be met. A post questionnaire was administered by the author at the end of the twelfth week to determine the level of participants' responses to different inservice training models. (Appendix D, p. 52)

CHAPTER II

Research and Solution Strategy

Studies have shown that interactive multimedia instruction has a variety of positive effects in our classrooms. Those include: greater learning gains, more efficient learning, higher rate of retention and greater consistency in content and instruction. (Eason, 1993)

It was wise to base a proposed educational intervention upon authentic research. Niederhauser (1994) examined how teachers' beliefs about computer-assisted instruction (CAI) related to the types of instructional software used by students. Data were collected through a survey to every public elementary, middle, junior high, and high school in one state. The survey focused on teacher demographics, beliefs about effectiveness of using computers in instruction, the amount, frequency, and type of CAI teachers engaged in, frequency of use, subject areas for software used, and types of training they received. The findings of the survey showed that beliefs about effective use of technology for instructional purposes can be differentiated into two discrete categories: some believe that computers are tools that students use in collecting, analyzing and presenting information and others believe computers are teaching machines that present information, give immediate feedback, and track progress. The researchers concluded that elementary teachers favored a more transmission-oriented view, while secondary teachers favored a more constructivist view.

Dickinson (1994) stated that only about one third of the teachers in the United States have had as much as eight hours of training in technology. The increasing availability of technology will mean little unless effective training is provided, as well as ongoing opportunities for staff development. Modifying learning environments, especially with the help of multimedia technology, can vastly improve learning and even the very development of intelligence. In addition to providing an interesting variety of materials and topics for stimulation, educators know that interactivity is the key element of a positive, nurturing, and stimulating environment. Research by Bentley (1995) produced a survey to acquire information about training of teachers in technology. The survey considered general information and student characteristics, learning about hardware and software, the dissemination of educational technology and information about telecommunication. Thirty-two surveys were completed by directors of curriculum materials centers in schools of education. The response rate was 67 percent. Twenty-seven schools provided some type of training and only 16 indicated the training was part of a required course. The findings suggested that technological training received by preserves teachers is inconsistent and not focused. The researcher concluded that with technology capabilities surfacing faster than society can absorb them, teachers and students are likely to acquire skills simultaneously in the classroom in the future.

Lombardie (1995) stated that it takes more than equipment for a multimedia classroom to be effective. Equally important is a qualified

teacher. You need people who know about learning and the computers. Together, the teachers and students are learning by creating and creating something others can learn from. Carlson (1994) offered guidelines for designing multimedia staff development. Suggested activities that can motivate teachers to use multimedia were:

- limit "awareness" sessions
- address transfer training
- offer a range of strategies and approaches beyond the workshop
- limit the use of telling as a strategy
- "What do you need right now to help your use this with students?"
- design a three year staff development plan and focus on effective applications

Preparing teachers to use multimedia is more time consuming and more complex than preparing teachers to use previous instructional technology. Because of their expanded instructional experiences, those teachers will be better able to reach more students. By making multimedia practical, putting teachers in control, and linking multimedia devices to teachers' beliefs, staff developers can ensure maximum benefits to teachers and students. West and Hayes (1996) noted that in successful technology courses, the instructors minimized the structure in their classrooms to allow for a higher degree of interaction. Most of the responsibility for learning was placed on the shoulders of the students so

they would develop life long interest in learning.

Research has shown that students retain more when they "do" something, rather than when they hear it or read it. (Ezzell & Curran, 1996) In order to create multimedia projects, students must use creative thinking, problem solving, decision making, and organizational skills. The teacher works as a facilitator to help meet the student's individual learning styles and help students feel successful. These new attitudes help students gain self-confidence and carry over to other curricular areas. When teachers were surveyed about what they appreciate about LaserDisc, teachers responded with comments like:

- "Students growing up in our rapidly changing world need to change to hold their attention. Teachers do, too."
- "The generous variety of laser discs available today provides welcome tools for teaching required curriculum mandates in a fun, challenging manner."
- "I've seen teachers grow more confident and more versatile, proud of the fact that they've been able to master a task that initially seemed so difficult." (Pioneer, 1996)

The LaserDisc effectively meets teachers' needs for easy-to-use instructional tools that fit curriculum and students' needs for compelling learning tools that stimulate interest. The research of Johnston (1995) focused on what students can learn from watching the Channel One programing. Johnson tracked 156 schools around the country over a

period of three years. A survey was sent to a nationally representative sample of schools from the thousands that carry the Channel One program. The findings of the survey indicated that student learning level is moderate to large when viewing the Channel One news program, and the information students learned was valuable. The researcher concluded that students learned from the Channel One programming and that it helped students acquire valued information about the insights into the world around them. In order to achieve real benefits for students, teachers must be prepared to help students assemble the somewhat fragmented knowledge that we know as "the news" into a coherent picture of world events. McBride and Luntz (1995) stated that one of the goals as educators was to help each of our students find true success and satisfaction in learning. It is important to recognize that good multimedia stack design, consistency and creativity all determine how effectively information is communicated to the user, or audience of the stack. These authors also believe that these design factors also weigh heavily on how well information is retained by the user.

At the 1997 Florida Educational Technology Conference in Orlando, Florida Star's (1997) presentation followed up on the thinking of McBride and Luntz as stated above.

> "Planning, research, organization and presentation of a multimedia project are all essential elements of multi media production. Multimedia should be considered a means of mastering the curriculum and not the curriculum itself.

> Multimedia has the potential to be a highly effective learning tool, giving students greater opportunities to explore content and become more involved in the learning process". (p. 5)

Evaluation in the form of documentation of student learning by using multimedia is new to many educators. In its simplest form, multimedia is a computer-based application or presentation that combines two or more of the following: text, recorded sound and music, still images, video and animation. (Haskin, 1994) The results of mixing different media into interactive applications is very powerful. The best multimedia is interactive, which means you can communicate with the application to learn what you want, or you can navigate through the information. This basic information is a valuable component to the overall project.

The status of research in regard to educational multimedia is much like the status of research in regard to educational technology in general, it is inconclusive. The newness of electronic and digital technology, coupled with the nature of learning and human potential that has challenged education theorists throughout time, makes finding "proof" of multimedia efficacy in education an elusive goal. (Ward, 1994) In an extensive review of literature by Moore, Myers and Burton (1994), there appears to be little useful research on multimedia. The terms of multimedia and interactivity are defined universally. Many current guidelines for development of multimedia programs can be traced to the

behaviorist learning theory tradition of Thorndike and Skinner. According to Moore, Myers and Burton, the most prevalent sources, however, are assumption, intuition and common sense.

The assumption that people are self-motivated is supported by motivation theory and research according to Green. (1995) This assumption is consistent with the reports of teachers that intrinsic rewards of teaching such as reaching a child, seeing growth and development, fostering learning are most significant to them. Self-motivation is also characteristic of young people. In Green's study, a significant number of students in all schools studied were more motivated to learn when computers were a daily part of their learning environment.

Solution Strategy

Based upon the findings of the research articles discussed above, the author intended to initiate a 12 week consistent and focused training program to meet the needs of the participants at the target site as indicated on the needs assessment survey given prior to the onset of the training program. The research of Niederhauser (1994) showed the relationship between training and use of technology with students on the student-centered constructivist factors played a key role in the integration of advanced technology. It was not so much the technology, but who was behind it that was important. The researcher agreed with Niederhauser in that teachers and students needed to be a part of the planning, acquisition phase and training in order to become comfortable and

enthusiastic. When this happened, teachers and students would more readily initiate the use of technology into their instructional practices. The research of Bentley (1994) indicated that teachers' technology training was inconsistent and not focused. This being the case, the teachers who were already in educational systems had only the training they sought independently. As stated, only three out of 14 teachers started at the target site with a positive comfort level using technology. While the academic teachers improved their basic skills in the field of technology, further training and modeling would help them integrate the technology available at the target site into the daily curriculum. The research method of Johnson (1995) with the Channel One program clearly demonstrated the effectiveness of video technology and innovative news programing. Following Johnson's lead, the researcher planned to implement in-house video training as part of the teacher inservice component as an additional form of training. Two basic reasons for using multimedia as an educational tool were that it allowed participants to integrate more effectively the increasingly vast volume of information students needed to learn and it provided the vehicle for students to become adept communicators in a knowledge-based society (McBride & Luntz 1995). The researcher felt that with the advancing technology capabilities in the classroom, teachers and students both benefited by acquiring skills simultaneously in the classroom.

The researcher worked with a small group of teachers and students to research and develop successful training that would increase

technology usage at the target site.

CHAPTER III

Method

Prior to implementing the 12 week multimedia training, written permission was obtained from the district administrator, school administrator, and the Exceptional Student Education science teachers and students at the target site. (Appendix E, p. 54) The teachers were selected by the researcher by willingness to participate for the full 12 weeks. Teachers that agreed to the proposal guaranteed commitment to the end of the project and requested that all information be shared on an ongoing basis. The teachers' initial concern was, even though they had some training they did not want to be left alone with students and a multimedia project. Targeted teachers and students had the right and freedom to decline involvement in this research project and were notified of that fact in writing prior to the time when an initial needs assessment was given. The permission letter went to all students in the target teachers' middle and high school science classrooms. Of a possible 35 students, 14 responded favorably with parent permission. After a few weeks into the training, several students said that parents would not sign the permission to participate because they thought that it meant that the parent had to be involved in the 12 week training. The students said that their parents were just too busy and didn't understand that the project only involved students during regular school hours.

The author/researcher was responsible for introducing the

program to all persons involved, including district supervisors and site based administrators. This researcher enthusiastically presented the program to the target academic teachers in a way to strengthen their technology skills while encouraging increased use of technology in the classroom. The district administrator for technology, when initially told about the research project, asked that the final report be shared with all of the county's technology specialists at the fall meeting. The school administrator and target site staff responded positively to the proposed project and, not only expressed an interest in status reports and continued progress, but asked that the information gathered be used in the target site technology incentive grant for the following year. Permission from supervisors and participants were requested two months prior to the implementation of the research project. The researcher applied for a grant six months prior to the onset of the research project to give the teachers involved a head start in training. (Appendix F, p. 56) A full day of inservice, during the school day, was provided for the teachers. (Appendix G, p. 58) The grant paid for the classroom substitute teachers. Short follow-up sessions were held for the target teachers to help facilitate beginning skills needed to understand the power of the multimedia programs.

The researcher administered a needs assessment survey, prior to the beginning of the research project, to the targeted teacher/student group to determine comfort level in using multimedia technology in the classroom and willingness to participate in the research. From the

surveys returned, the researcher offered training to meet the needs and agenda of the targeted participants so that the outcome was beneficial for student curriculum development. The initial survey indicated that both students and teachers had a basic understanding of what multimedia was, but not the power available to create individual projects for curriculum studies. The same survey was used at the end of the 12 weeks to determine the level of increase in multimedia skills. The topic for the multimedia project was determined by the entire research group. The participants were disappointed that a multimedia program that they had been using only had four levels of utilization. Once all four levels were played out, the main portion of the multimedia program was exhausted and could only be repeated. Students enjoyed the challenge of the initial program, but found no satisfaction repeating lessons already conquered. As a group, everyone involved decided to create individual multimedia programs using the same original theme and play the programs in the other classes at the end of the 12 week research project. Even though the researcher knew that the participants were asking for a lot of work in a short amount of time (12 weeks), the researcher felt the project was realistic with the combined effort of the researcher and teachers. The teachers participating were skeptical, even though they were just as eager as the students to do the proposed projects. The researcher's enthusiasm and guarantee of continuous assistance won out and the proposal was adopted.

Training for teachers was provided in a variety of ways to model

the uses of technology in the classroom to enhance content area teaching. The training was scheduled during planning time and a substitute day provided by a grant. Models that were used included: cooperative learning, independent study, a full day of new programs with collaborative interdisciplinary lesson planning, and preview times for new software and hardware.

Training materials, hardware and locations were used from resources currently existing at the target site. This enhanced the use of what the teachers already had available. The schedule of training materials, training times and locations was planned in conjunction with the cooperation of the target site media specialist's schedule.

The first week of the research program, the researcher meet with the participants and discussed the 12 week agenda. A copy of the agenda was left in the classroom with the dates of each week clearly marked so that participants could track their progress. Each time the researcher was in the classroom participants discussed presentation style and were reminded that at the end of the 12 weeks, a survey of preferred learning styles would be given. The initial first-week introduction was done through lecture on the first day and later in the week by showing a small multimedia program that the researcher created demonstrating the ease of creating and using multimedia. (Attachment: Science Class) The PowerPoint multimedia presentation reinforced the guidelines, expectations and expected outcomes of the research project. The training schedule was discussed. It was

determined that the researcher would be in the classroom every Tuesday and Thursday to assist with multimedia sessions. The teachers chose Monday, Wednesday and Friday to continue with experiments, lessons and integrated learning labs in science. One concern of the teachers at this time was the behavior of the students. Because we were working with emotionally handicapped and severely emotionally handicapped students, teachers were worried that students may not be able to maintain an interest to complete the daily work needed to achieve success by the end of the 12 weeks. In discussing the concern of the teachers, the researcher suggested that the students be given a choice each day. Students could either participate with a project group and work on a multimedia program or do assigned science class work that the teachers would always have ready. Both teachers and researcher were pleased with this plan.

Technology usage was charted randomly in weeks one, three, five, seven, nine, and eleven. The researcher spun a timer at the beginning of each class period. When the timer went off, the researcher observed the percentage of the target participants that were engaged in multimedia activities in the ESE science classroom. (Appendix H, p. 60) The random observations clearly show that as participants learned more about multimedia their time engaged at the computer working on content material increased drastically, from zero percent in week two to 100 percent in week 11.

In addition to the three networked computers in the classroom, the

media/technology specialist placed an Apple Macintosh 5400 AV computer in the classroom along with a monitor/vhs unit. The classroom already had a presentation station that consisted of a computer, laserdisk player and interface connection to a 25 inch color TV. PowerPoint and Digital Chisel were added to the computer's hard drive. The media specialist followed-up with additional technology and software needs as the project progressed. Students became so involved in the initial training that an additional laserdisk player, a monitor and a color powerbook were added to the classroom so students could practice multimedia skills.

Follow-up training was done with the researcher and the participants in their classrooms for reinforcement and repeated practice. These follow-up sessions included modeling an integrated technology lesson, team teaching, whole group instruction using a presentation platform to introduce content to be studied, and/or following up on current inservice skills recently presented in training.

In weeks two and three the researcher continued working with the target science classes on Tuesday and Thursday. PowerPoint presentations were viewed by the class and students added to a database of scientific facts about the planets. The presentation methods used were demonstration, small groups and learning cards that had step by step directions for creating a basic outline in PowerPoint. (Attachment: Teaching With Presentation Software)

The video training using Digital Chisel VHS tape with the

VHS/player monitor set up next to the computer began in week three and continued through week four. Participants were encouraged to watch the video training tape and utilize the pause button and do the skill that was just demonstrated on the video. At this point even though there were four computers in the classroom the researcher noticed that students not engaged with the hands on learning lost interest. A fifth computer, a color powerbook, was added to the classroom as an extra practice station. "Your only limitation is your imagination" was created on a poster added to the classroom. This was an understatement when participants learned that they could record and playback their own sounds. According to the researcher the best recorded sounds were a group that created a rap type song saying thank the researcher for bringing multimedia computers into the classroom.

During week four, the researcher noticed the teachers start to relax as they continued to guide students through the multimedia process. The initial plan to give the student a choice between the multimedia lesson or the content area lesson had worked. No matter what students chose, they appeared to be focused on the activity of choice. During post planning that week, the teachers expressed concerns about the size of the proposed project. The researcher reviewed the 12 week agenda again with the teachers and tried to ease some of the fears. A large amount of stress seemed to still come from the teachers lack of complete comfort using multimedia. The video training was a success with all of the participants and additional video training materials were offered for

students who felt comfortable completing the Digital Chisel training video. (Attachment: Wild Wild West) The Digital Chisel video training, Wild Wild West, was created by the researcher for additional practice of multimedia skills. Participants had begun talking about the video training in other classes, asking teachers to do a similar project. Two teachers that were not participants spent time after school hours for the next several weeks doing the video training on their own and learning how to use the program with the help of research participants throughout the day. Three other teachers attended a workshop on multimedia after seeing the teacher and student participants' excitement over the project. Three of these five teachers, though not involved in the research project, started using multimedia in daily classroom lessons.

Week five continued practice skills in multimedia training and training in designing stack blueprints. Participants were shown three organizational examples of stacks (linear, hub and tree structure). The project checklist was discussed and the researcher made sure that all of the participants understood the requirements of the finished project. A sample storyboard was created using the original packaged program as a guide. Participants decided on a combination of stack design using a linear design then branching into a tree structure. The final stack blueprint consisted of 27 individual cards or screens. Posters of the stack blueprint were make in the media center on a poster machine that enlarged the students' work and the blueprint poster was hung in the classroom for reference.

In the weeks that followed, participants were given a team envelope (8 1/2" x 11") to hold collected work. Included was a note pad for any research notes and collected materials and a booklet created by the researcher to use as a guide for the project. The guide book was titled: Top Secret Work Space Probe - - - - research and planning department. (Attachment: Top Secret Work) Each group selected a four digit number, the first number being the class period to help identify their projects. The other three numbers were selected by group brainstorming. Included in the guide was a calendar mapping out the cards that needed to be completed each week in order to have a finished project by week 11. A project overview asked that groups select a planet, create a probe number and included useful information as a guide when working on expert reports. A blank stack blueprint form was included in case the group wanted to redesign the program and an outline defining the topic of each card was added. Participants used the New Rescue Adventure worksheet to gather information about their planet in order to create transmission information from the lost space probe. The following 54 pages were two part guides for each individual card. Using PowerPoint and printing cards as slide notes, the researcher was able to print a rough sample of what the card might look like and some text below as a basic information guide. The second part of each allowed the participants to keep detailed information of each card. This included drawings, template design, color, text, clip art, movies, sounds, buttons and transitions. As participants worked through the project the

researcher felt that it would have been helpful to have a printed chart of all of the Digital Chisel creation options posted clearly by the computer. Participants used the Top Secret Work guidebook to record information about their project as it was being done on the computer. As some of these participants return next fall to the target school, the researcher hopes that they can use the guide to pre plan prior to sitting down at the computer and use the guide as a rough draft. The final pages in the guide consisted of samples of the Project Checklist (Appendix: I, p. 62), Student-to-Student Critique (Appendix: J, p. 64) and Project Evaluation. All forms were also kept at the multimedia center in the classroom in a folder in case participants needed extra copies of a particular instrument.

At the end of the first day of actual computer work on the projects, one teacher said that she did not think that she could continue this for the rest of the research time. We discussed the teacher's feeling about the day. All participants were actively engaged, but the work itself on the computer was intense. The researcher helped the teacher facilitate and guide the student participants through the first few template cards in the stack. The teachers were still feeling insecure about personal strengths with the multimedia programs. The researcher encouraged the teachers to continue with the project and allow themselves and the student participants to become experts in multimedia through trial and error. The researcher reminded the teachers they were in a safe environment; that the researcher would be close by for assistance.

By weeks nine and ten all participants, were heavy into multimedia

creation using the research gathered on the topics. The researcher increased time in the classroom from two days a week to three and was on call the other two days as needed. Participants, working on cards six through 23, now had a better understanding of the multimedia process and how the templates would flow together to become an organized base of content information. While the students were challenged and having fun, there were times when a student chose not to participate in the multimedia activity and do the content material planned for that day. Participants did not seem bothered by missing a day at the computer, but encouraged teammates to continue and gave praise when the team shared material at the end of the class. The teachers always had valuable content activities planned that complemented the area of study that was covered in the multimedia projects. The researcher felt that this cooperation was a vital link to the overall success to the program.

When week ten came around, the teachers had taken over completely and the researcher, who still attended the scheduled classes, was now simply a consultant. The teachers were relieved and pleased with the classes. All participants seemed to learn multimedia skills quickly and were able to transfer the skills to the content material creation easily and with good understanding of the final outcome of the project. All classes had been on schedule as prescribed in the guide book Top Secret. The teachers commented on the quality of information the students had gathered and were able to use in the project. Teachers also noted that there had not been any discipline problems in the class

since starting the multimedia research project.

Week eleven was the most exciting part of the project for the researcher. As the participants finished projects and interacted with the project as completed, they were able to do final editing and some changing on templates that they were not satisfied with. The overall comment was, "We did that?" They just couldn't believe that it was not only finished, but that they had done a very good job. The teachers were thrilled with the end projects and continued individually after school hours to practice. The teachers also used time to create a multimedia test using Digital Chisel from the research material student participants gathered. Student participants took the test and all passed with 100 percent accuracy in week 12. The teachers determined that the content material they used in creating the multimedia projects was retained at the end of the 12 week research project. In fact, classes took tests that were created for other class periods and passed with knowledge gained by doing the other groups finished multimedia projects.

The final week of the research, targeted student groups presented projects to other class periods. The other classes responded to the multimedia project with enthusiasm. The researcher created GSSR New Probe worksheets from the material and information in their multimedia stacks. (Attachment: GSSR New Probe) After completing the projects the players cooperatively did the Student-to-Student Critique, the teachers acted as secretary and recorded information. Participants were very honest and sincere in evaluations, mentioning buttons that did not

work, text that was hard to read and busy cards that were hard to understand. What surprised the researcher most was that every group mentioned one or more thing that they really liked about the project, the layout or flow of the project, a voice or a sound effect. These Critiques were shared with the creators the following day in class. Participants choose to follow up on the Student-to-Student Critiques and make the mentioned changes prior to the teacher final evaluation. Target participants were very pleased with the final projects and continued to invite other students and staff to come interact with their programs. Other staff members were continually amazed at the quality of the product and information.

A post-survey at the end of week 12 determined if teacher and student comfort level in using multimedia technology in the classroom had increased.

A post interview with the author and target participants was done at the end of the twelfth week to determine the participants' responses to different inservice training models. The post interview results clearly indicated that participants rated the presentation methods as follows: (the highest preferred presentation style to the lowest) cooperative learning, small group instruction and interactive demonstration, video training and demonstration, lecture, finally learning cards. Considering many of the targeted participants also are identified as having learning difficulties the researcher was not surprised with the order of preference to the presentation methods. The researcher believes that small group

and cooperative learning work well in the classroom setting and at the same time simulates the real world working environment.

At the end of the 12 week research project the target teachers evaluated student projects. Production projects were evaluated on inclusion of all items specifically designated as part of the project (color, graphics, design specifications, media forms,and evaluations) and a final grade score between 85% to 100% on the evaluation scale. Participants were involved in the evaluation process, they selected 10 key areas out of a possible 20 that they wanted to be graded on in the final evaluation.

CHAPTER IV

Results

The original proposal objectives stated: If, after the 12-week multimedia technology training period, 100 percent of the students increase knowledge, comfort level and build enthusiasm for technology as exhibited by their increased use of technology in the classroom shown through the researcher's random observations and comparison of a pre and post survey, this objective will be met. (Appendix A, p. 44) Comparing the pre and post multimedia survey there was a 100 percent increase in all areas with the exception of two advanced multimedia skills that were not covered in the 12 week research project. The results of the survey showed an increase in 98 percent of the areas. The areas that showed no increase were advanced skills that were not covered in the 12 weeks of research. All participants were surprised at the knowledge they had gained when doing the post survey. One comment most frequently heard by the researcher was, " I really did learn a lot!". The researcher believed the participants not only surprised themselves, but the teachers as well. Comfort level was not only noted in the post survey, but throughout the last half of the research project. The overall enthusiasm and pride in multimedia and created projects was evident in participants wanting to share the daily progress and final projects with others. Enthusiasm was also recorded when a class of target participants came running into the media center to share a newspaper

article about "Small new planet discovered in solar system", that type of carryover generalized success. Technology usage was charted randomly in weeks one, three, five, seven, nine, and eleven. The researcher spun a timer at the beginning of each class period. When the timer went off the researcher observed the percentage of the target participants that were engaged in multimedia activities in the ESE science classroom. Numbers below are the percentage of target participants actively engaged at the computer doing multimedia activities at the time of researcher's random observations.

Week	Period 1	Period 2	Period 3	Period 4	Period 5
one	0	10	0	0	0
three	0	40	30	0	20
five	50	100	95	100	90
seven	100	100	100	100	100
nine	100	100	100	80	100
eleven	100	100	100	100	100

If after 12 weeks, 80 percent of the target students increase their behavior grades by one point on a scale of one to five, then this objective will be met. This was to be evaluated by comparing the pre and post implementation scores. (Appendix B, p. 47) Students' positive classroom behaviors increased one level or more due to added motivation focused on the academic course work through multimedia projects. Throughout the research project the behavior in the science

classroom increased 100 percent. There was not one behavior problem that resulted in the lose of a point on the level system and no student received a referral during science class in the 12 weeks of research. This was a notable difference in the emotionally and severely emotionally handicapped classroom where inappropriate behaviors were frequently being addressed. By infusing the training into the classroom, the researcher brought the behaviors of both the teachers and students to a higher level and established deliberate efforts to coordinate technology with learning, and seek alternatives to the demonstration of student learning.

If, at the end of the 12-week multimedia technology training period, 100 percent of the target students have completed a full multimedia project and scored 85 percent on the final evaluation instrument, this objective will have been met. This was determined by an evaluation rubric. (Appendix C , p. 50) Each one of the participants not only finished their multimedia project, but they were able to maintain the time line prescribed in the guidebook Top Secret. The teachers' final evaluation for each student was 100 percent mastery. This score was well above the expectations of the researcher.

If, after the 12 week multimedia technology training period, 100 percent of the target participants respond a three and above on a scale of one to five to the various modules used in presenting training, this objective will be meet. A post questionnaire was administered by the author at the end of the twelfth week to determine the level of

participants' responses to different inservice training models. (Appendix D, p. 52) The post interview results indicated the participants' preferred presentation methods listed below in order of most preferred to least:

- cooperative learning, 100 percent
- small group instruction and interactive demonstration, 93 percent
- video training and demonstration, 86 percent
- lecture, 71 percent
- learning cards, 64 percent

Considering many of the targeted participants also are identified as having documented difficulties in reading, the researcher was not surprised with the order of preference to the presentation methods. The participants benefited in working in cooperative groups and being able to interact with others when challenged with a learning difference. As the project grew, teams developed closer personal relationships with each other and acknowledged strengths and weaknesses in all team members. The researcher believed that small group and cooperative learning worked well in the school setting and also simulated the real world working environment.

Credit for the overall success of this research was the combined effort of the researcher and the teachers. By allowing participants to make choices of learning activities each day in the classroom, participants seemed more responsive to the overall long term project. Participants were encourage to keep to the time schedule, while at the

same time they learned to acknowledge that they needed either a break from the project or needed to remove themselves from the project in order to refocus when they were feeling overwhelmed. By the completion of the the research project, the enthusiasm from all targeted classes had generated interest in all other areas of the target facility. A video tape was made of the projects and shown over the in-house TV system. Tapes were made available for students to take home to share with their families. (Attachment: GSSR New Probe) The researcher and participants transferred the computer generated multimedia projects to VHS tape format. The video tape included a copy of each new probe that classes had created.

CHAPTER V

Recommendations

The researcher will share the details and results of the multimedia program and software evaluation with the administration and the faculty of the target site. (Appendix K, p. 66) A report will be written and mailed to all target teachers involved in the research. The author will include published research based on information about the benefits of teacher technology training to enhance technology use in the classroom. This researcher will encourage all teachers to include technology training and strategies within their own subject areas. The researcher will write a proposal to suggest continuation of teacher technology training as a way to optimize critical thinking skills in selecting and using these new strategies in the classroom with the students to enhance the delivery of content material. The final research paper will be shared at the district technology specialist fall meeting and will be used to document current needs and progress at the target site for the School Improvement Plan and the Technology Incentive Grant.

The researcher believes that participants would have had been more comfortable at the onset of the project if there had been a printed chart showing all of the options in the program Digital Chisel that they could have used as a reference guide. The researcher will design a Digital Chisel reference guide before the next Digital Chisel multimedia training. The design page in the guidebook Top Secret needs to have

some terminology changed to reflect the terms used in Digital Chisel making sure all terms match functions.

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Appendixes

Appendix A

Pre and Post Teacher and Student Multimedia Survey

Appendix A

Pre and Post Teacher and Student Multimedia Survey

Multimedia survey: The information collected with this survey will be used to determine multimedia training needs. Place a check in the box the expresses your skill level.

The numbered tally in each column represent the number of teacher and student responses in each category for the pre or post survey.

Pre Survey Results:

	I don't know		I know a little		Computer Expert
Multimedia Skill	**1**	**2**	**3**	**4**	**5**
Start multimedia program			1		14
Name your project	9		4		2
Create text fields & enter tex	13			2	
Import pictures, movies, and s	6	1	2	2	4
Create a new screen	13				2
Work with graphic libraries	6	1	2	2	4
Record your own sounds	9		3	2	
Use a tool palette	13				2
Use the Paint and Draw tools	2	1	9		3
Use a question template	13				2
Make hypertext entries	13				2
Edit and delete screens	13				2
Use the screen list	13		1	1	
Create a database	9	4	1	1	
Select advanced level	13			2	
Add screen transitions	13		2		
Add auto-play events	13		2		
Add screen timeouts	13	2			
Add events to objects	13	2			
Work with backgrounds	15				

The numbered tally in each column represent the number of teacher and student responses in each category for the pre or post survey.

Post Survey Results:

	I don't know		I know a little		Computer Expert
Multimedia Skill	**1**	**2**	**3**	**4**	**5**
Start multimedia program					15
Name your project					15
Create text fields enter text					15
Import pictures, movies, and sounds					15
Create a new screen					15
Work with libraries					15
Record your own sounds					15
Use the tool palette					15
Use the Paint and Draw tools					15
Use the question template			2	9	4
Make hypertext entries					15
Edit and delete screens					15
Use the screen list					15
Create a database	10		3		2
Select advanced level					15
Add screen transitions				3	12
Add auto-play events					15
Add screen timeouts	15				
Add events to objects					15
Work with backgrounds					15

Appendix B

Participant Information

Appendix B

Participant Information

All participants are numbered randomly and identified as a teacher or student as permission letters returned with positive response to participate in this research activity. This numbering system will be used throughout the entire research project to identify an individual participant. Behavior is indicated as part of the "Phase Behavioral System" used at the target site to track daily positive behaviors. Green is the lowest behavioral expectations on the scale using a scale of 1 - 5, then Blue (2), Red (3), White (4), Graduate (5) students are no longer on the "Phase System" and are at the high end of behavioral expectations. Students may earn a maximum of 12 points per class period.

Third Quarter Report	Grade Level	Behavior Science Class	Science Grade	Overall GPA	CCC Science Grade
participant number & id.			grade A=4, B=3, C=2, D=1, F=0		
1 - teacher	na				
2 - student	10	2	3	1.5	4
3 - student	8	1	0	0.33	0
4 - teacher	na				
5 - student	9	1	2	1.6	3
6 - student	8	2	2	1.8	4
7 - student	8	2	4	2.3	3
8 - student	6	1	3	2.5	3
9 - student	6	1	3	2.6	3
10 - student	9	1	1	1.5	1
11 - student	9	3	2	1.6	3
12 - student	7	1	0	0	0
13 - student	8	2	0	0.66	2
14 - student	11	2	0	1	4
15 - student	11	2	3	0.83	3

A "*" on the Fourth Quarter Report indicated an increase in positive behavior in the science classroom. The researcher did not track the fourth quarter overall GPA because the focus was in the science classroom only. To include the overall GPA would open the research to many more outside variables than were necessary for this project.

Fourth Quarter Report	Grade Level	Behavior Science Class	Science Grade	Overall GPA	CCC Science Grade
participant number	& id.		grade A-4, B-3, C-2, D-1, F-0		
1 - teacher	na				
2 - student	10	3 *	4		4
3 - student	8	3 *	3		2
4 - teacher	na				
5 - student	9	3 *	3		3
6 - student	8	3 *	3		3
7 - student	8	2 *	4		3
8 - student	6	3 *	3		3
9 - student	6	2 *	3		3
10 - student	9	3 *	3		2
11 - student	9	4 *	3		4
12 - student	7	2 *	3		2
13 - student	8	3 *	3		3
14 - student	11	3 *	2		4
15 - student	11	3 *	4		4

Appendix C

Project Evaluation

Appendix C

Project Evaluation

Teacher's Name ______________ Group Name ______________
Project Name ______________ Due Date ______________
Members of Group ______________ ______________
______________ ______________

	Inc	... Poor	... Fair		... Good	...	Ex
☐ ***Planning***							
Students completed card planning sheets for the stack.	4	5	6	7	8	9	10
Students did research to present factual and interesting information.	4	5	6	7	8	9	10
Students used at least ____ references in gathering information.	4	5	6	7	8	9	10
☐ ***Consistency***							
The stack design reflects consistency and creativity.	4	5	6	7	8	9	10
Navigation buttons are consistent, easy to understand and placed in the same location from card to card.	4	5	6	7	8	9	10
Fonts and transitions are consistent from card to card.	4	5	6	7	8	9	10
☐ ***Stack Design***							
Stack design reflects planning for the intended audience and stack purpose.	4	5	6	7	8	9	10
Visual contrast between text and background is present.	4	5	6	7	8	9	10
Text used is easy to read and read only except where user input is required.	4	5	6	7	8	9	10
☐ ***Creativity***							
Color, clip art, and artwork are consistent and complimentary to stack content.	4	5	6	7	8	9	10
Original artwork, pictures, clip art etc., are used creatively.	4	5	6	7	8	9	10
*Borders/buttons using original artwork, clip art or other sources are included.	4	5	6	7	8	9	10
*Animations are complimentary to the stack content.	4	5	6	7	8	9	10
☐ ***Content***							
Understanding of topic is evidenced by factual and interesting information.	4	5	6	7	8	9	10
Complete sentences with correct punctuation, grammar and spelling are used.	4	5	6	7	8	9	10
Project includes a minimum of ____ information cards per student.	4	5	6	7	8	9	10
Clip art, backgrounds and original artwork are included in the stack(s).	4	5	6	7	8	9	10
The stack(s) contains the basic parts which include a title card, table of contents, bibliography card, and a student "credit card."	4	5	6	7	8	9	10
*All maps include a map key; any diagrams are labeled and both use correct spelling and capitalization.	4	5	6	7	8	9	10
______________	4	5	6	7	8	9	10
______________	4	5	6	7	8	9	10

*Extra Credit

Total Possible ____ Total ____

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Participants were involved in the evaluation process, they selected 10 key areas out of a possible 20 that they wanted to be graded on in the final evaluation. All students scored 100 percent on the final evaluation form.

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Appendix D

Post Interview

Appendix D

Post Interview

Participants will be asked to score the presentation methods presented over the 12 week training session according to their preferred learning style. Scores will be marked one to five, one being the lowest and five being the highest.

Participant results marking a three, four or five = **Percent**

1. On a score of one to five, one being the lowest and five being the highest, how would you score the teaching delivery method using lecture? **1 - 2 - 3 - 4 - 5** **71**

2. On a score of one to five, one being the lowest and five being the highest, how would you score the teaching delivery method using small group instruction? **1 - 2 - 3 - 4 - 5** **93**

3. On a score of one to five, one being the lowest and five being the highest, how would you score the teaching delivery method using demonstration? **1 - 2 - 3 - 4 - 5** **86**

4. On a score of one to five, one being the lowest and five being the highest, how would you score the teaching delivery method using interactive demonstration? **1 - 2 - 3 - 4 - 5** **93**

5. On a score of one to five, one being the lowest and five being the highest, how would you score the teaching delivery method using learning cards? **1 - 2 - 3 - 4 - 5** **64**

6. On a score of one to five, one being the lowest and five being the highest, how would you score the teaching delivery method using video training? **1 - 2 - 3 - 4 - 5** **86**

7. On a score of one to five, one being the lowest and five being the highest, how would you score the teaching delivery method using cooperative learning? **1 - 2 - 3 - 4 - 5** **100**

Appendix E

Permission to Participate

Appendix E

Permission to Participate

March 1997

Dear

You are invited to participate in a 12 week multimedia research project conducted by Mrs. Researcher, Media/Technology Specialist at the Alternative Education Center, in conjunction with the completion of her masters degree in Educational Technology at NOVA University. Faculty and students are in no way required to participate in this research program, all participation will be voluntary.

The outcome objectives are to build increased teacher and student awareness, adaptation, analysis and application to a comfort level that assists in building enthusiasm for multimedia technology. A second goal is to have the target group of teachers use these new strategies in the classroom with the students to enhance their delivery of content materials. Mrs. Educator's science students will study resources and materials needed for multimedia production, design and presentation at the end of the 12 week training period.

Mrs. Researcher will share the details and results of the technology training program with the administration, advisory council, faculty and students at the target site. The written report will be housed in the media center for any parent or community member to review the program or results.

If you have any questions, please feel free to call the researcher at Alternative Education Center (000) 000-000.

Sincerely,

Administrator

I understand my right in regard to the research project:

_____ Yes, I give permission to participate in the research project.

_____ No, I do not give permission to participate in the research project.

Student Permission to participate:

Student's Name: _____ Parent's Signature: _____

Faculty permission to participate:

Faculty member signature:_____

Appendix F

Grant MSTAT

Appendix F

Grant MSTAT

Title II, Dwight D. Eisenhower Professional Development Program Application

C. PROPOSED SCHOOL PROGRAM FOR 80 PERCENT OF FUNDS

SCHOOL DISTRICT	SCHOOL

1. Budgeted Amount for this School Program $ 581.31
   Please use one page for each proposed school program; duplicate this page as needed.

2. Action Plan

Goal (Show relation to Needs)	Description of Activities	Completion Date	Anticipated Outcomes	Describe How This Activity Will Impact Student Performance
To improve science and mathematics instruction [40,60]	A one-day inservice workshop followed with a 1/2-day training will be provided on the use of Digital Chisel and technology available at Make available to teachers, school based, strategies for incorporating new technology into math and science teaching	1/97 1/97	Educators will learn to use the multimedia program Digital Chisel with technology available at the school site.	Participants' students will increase their knowledge of mathematics and science based upon the interactive multimedia presentation in instruction.

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Appendix G

Inservice Agenda

Appendix G

Inservice Agenda

Math and Science Inservice

Subs provided through the MSTAT Grant

Agenda

7:50 - 8:00	Welcome and Agenda
8:00 - 9:00	Station Exploration, 30 minutes each station Math Sleuths Science Sleuths
9:00 - 10:00	CCC Math and Science Patty Stepbach
10:00 - 10:15	Break
10:15 - 11:00	Digital Chisel Update
11:00 - 11:30	LUNCH
11:30 - 12:30	Station Exploration, 30 minutes each station Science Forums Internet, text base
12:30 - 1:00	Large Group discussion afternoon task assigned
1:00 - 3:00	Small group lesson development 15 minute break on your own
3:00 - 3:20	Large Group discussion Share lesson development plan with group, 10 minutes each group
3:20 - 3:30	Wrap up, Inservice paperwork and evaluation

Appendix H

Technology Usage Chart

Appendix H

Technology Usage Chart

Technology usage was charted randomly in weeks one, three, five, seven, nine, and eleven. The researcher spun a timer at the beginning of each class period. When the timer went off the researcher observed the percentage of the target participants that were engaged in multimedia activities in the ESE science classroom.

Numbers below are the percentage of target participants actively engaged at the computer doing multimedia activities.

Week	Period 1	Period 2	Period 3	Period 4	Period 5
one	0	10	0	0	0
three	0	40	30	0	20
five	50	100	95	100	90
seven	100	100	100	100	100
nine	100	100	100	80	100
eleven	100	100	100	100	100

Appendix I

Project Checklist

Appendix I

Project Checklist

Your finished project should include the following items. Use this sheet to check your multimedia project for key elements to achieve a high score on the final evaluation.

- ⬭ Stack blueprint planning sheet
- ⬭ Storyboard, required 5 - 10 cards in your stack
- ⬭ Research
  - ⬭ at least 3 reference facts
  - ⬭ at least 3 reference photos, movies etc.
- ⬭ Use preferences to select Advanced Level
- ⬭ Title Card
- ⬭ Navigation instructions
- ⬭ Text fields, easy to read
  - ⬭ Contrast with text and background
  - ⬭ Consistent fonts and styles
  - ⬭ Grammar: complete sentences, punctuation, spelling
  - ⬭ Information is easy to understand
- ⬭ Pictures, movies and sounds, one original artwork
- ⬭ Record your own sound
- ⬭ Animation
- ⬭ Paint and Draw Tools used
- ⬭ Auto play events
- ⬭ Link events to objects
- ⬭ Navigation button that is nonlinear
- ⬭ Bibliography
- ⬭ Card with author "credit" information

Appendix J

Student-to-Student Critique

Appendix J

Student to Student Critique

Project Name _____ Members of Group _____

Areas to Critique	+/-	Comments
☐ *Consistency*		
1. Stack design was consistent and showed planning on the part of the authors.		
2. Navigation buttons were easy to understand and did what they were supposed to do.		
3. Fonts used in text items and as titles are consistent.		
4. Transitions are consistent except where used for special effects.		
☐ *Design*		
1. Evidence of thoughtful planning in the design stage.		
2. Stack contains basic parts—title card, bibliography, table of contents, digitized pictures, clip art, original artwork, information cards, and "credit card".		
3. Contrast exists between text and background.		
4. Text used is easy to read(consider fonts, sizes, colors and styles.)		
5. Text items are read only except where input from the user is required.		
6. Navigation buttons are easy to use because of their placement.		
☐ *Creativity*		
1. Original artwork is present.		
2. Students have used pictures or clip art in a very creative way.		
3. Unusual borders using original artwork or clip art have been designed by the authors.		
4. Animation has been included to better illustrate an item(such as an event, routes, famous person).		
☐ *Content*		
1. Students have researched information to supply the user with interesting information.		
2. Students have used complete sentences, correct punctuation, grammar and spelling.		
3. I(We) learned information about this topic we did not know before.		
4. The students showed that they understood the topic of their stack		
5. Any maps include a map key, correct spelling, and are easy to understand		
6. Any photo is labeled and if possible, also contains a text item with information about the location.		

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Appendix K

Software Evaluations

Appendix K

Software Evaluations

NOVA SOUTHEASTERN UNIVERSITY
GTEP Software Evaluation Form

GTEP STUDENT: Karen A. Michalak EVALUATION DATE: 6/12/97

TITLE: PowerPoint PUBLISHER: MicroSoft

CHECK ALL THAT APPLY

___AcademicGame
___Drill and Practice
___Educational Game
_x_Simulation
___Test/Diagnostic
_x_Tutorial
___Administrative
Other Multimedia Software

LEVEL: ___Preschool _x_K-3 _x_4-6 _x_6-8 _x_9-12 _x_Adult

PURPOSE: _x_Remediation _x_Developmental _x_Enrichment

Computer: Macintosh (PC/Apple/Mac) on CD ROM no (Y/N) on INTERNET/WEB_____

Number of Drives needed: 1 Printer yes (Y/N) Other:_____ (specify)

CONTENT

1. Program has educational value	x
2. Grammar is accurate and free of syntax errors	x
3. Language is stereotype-free (race, ethnic, sex, etc.)	x
4. Content is adaptable to varied instructional strategies	x

QUALITY

5. Purpose of the program is well defined	x
6. Defined purpose is achieved	x
7. Presentation of content is clear and logical	x
8. Level of difficulty is appropriate for target audience	x
9. Sequence is organized in developmental steps	x
10. Graphics, color, and sound are appropriate for instruction	x
11. User controls the sequence of presentation	x
12. Entry-level prerequisites are specified	x
13. Program is user-friendly	x
14. Program is interactive	x
15. Corrective feedback is provided	x
16. Screen design is sound	x
17. Program is reliable and student-proof	x
18. Adequate error trapping is evident	x
19. Easy escape from program is provided	x
20. Record keeping/printouts of student progress is available	x

DOCUMENTATION

21. Manuals are available and user-friendly	x
22. Clear operating instructions and trouble shooting are included	x
23. Table of Contents, Index, and Glossary of Terms are provided	x

OVERALL RATING

_x_EXCELLENT ___VERY GOOD ___GOOD ___FAIR ___POOR

11/95

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NOVA SOUTHEASTERN UNIVERSITY
GTEP Software Evaluation Form

GTEP STUDENT: Karen A. Michalak EVALUATION DATE: 6/11/97

TITLE: Digital Chisel PUBLISHER: Pierian Spring Software

CHECK ALL THAT APPLY

X Academic Game
X Drill and Practice
X Educational Game
X Simulation
X Test/Diagnostic
X Tutorial
___ Administrative
Other Multimedia software

LEVEL: ___ Preschool X K-3 X 4-6 X 6-8 X 9-12 X Adult

PURPOSE: X Remediation X Developmental X Enrichment

Computer: Macintosh (PC/Apple/Mac) on CD ROM yes (Y/N) on INTERNET/WEB yes

Number of Drives needed: 1 Printer yes (Y/N) Other: multimedia attachments, digital camera etc. (specify)

CONTENT	
1. Program has educational value	X
2. Grammar is accurate and free of syntax errors	X
3. Language is stereotype-free (race, ethnic, sex, etc.)	X
4. Content is adaptable to varied instructional strategies	X
QUALITY	
5. Purpose of the program is well defined	X
6. Defined purpose is achieved	X
7. Presentation of content is clear and logical	X
8. Level of difficulty is appropriate for target audience	X
9. Sequence is organized in developmental steps	X
10. Graphics, color, and sound are appropriate for instruction	X
11. User controls the sequence of presentation	X
12. Entry-level prerequisites are specified	X
13. Program is user-friendly	X
14. Program is interactive	X
15. Corrective feedback is provided	X
16. Screen design is sound	X
17. Program is reliable and student-proof	X
18. Adequate error trapping is evident	X
19. Easy escape from program is provided	X
20. Record keeping/printouts of student progress is available	X
DOCUMENTATION	
21. Manuals are available and user-friendly	X
22. Clear operating instructions and trouble shooting are included	X
23. Table of Contents, Index, and Glossary of Terms are provided	X

OVERALL RATING

X EXCELLENT ___ VERY GOOD ___ GOOD ___ FAIR ___ POOR

11/95

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Attachments